DEPARTMENT OF COMMUNITY SERVICES
PLANNING DIVISION
TOWN OF WEST HARTFORD
50 SOUTH MAIN STREET
WEST HARTFORD, CT 06107-2431
TEL: (860) 561-7555 FAX: (860) 561-7504
www.westhartford.org

PERMIT APPLICATION FOR INLAND WETLANDS & WATERCOURSES

ACTIVITY: (check one of the following)

___ MAP AMENDMENT ✓ REGULATED ACTIVITY

File # 1045 Application Fee — Surcharge Fee — Date Received 5.18.16

Street Address of Proposed Application: Work in the Right-of-Way of Whitman Ave and Braeburn Rd, generally adjacent to 47 and 200 Whitman Rd & 45 Braeburn Rd.

Zone: R-10 Acreage/Lot Area N/A Parcel/Lot# N/A

Applicant's Interest in Property: _____

Brief Description of Proposed Activity: Perform repair to drainage culvert conveying Trout Brook under Braeburn Road/Whitman Avenue

The undersigned warrants the truth of all statements contained herein and in all supporting documents to the best of his/her knowledge and belief. Furthermore, the applicant agrees that submission of this document constitutes permission and consent to Commission and Staff inspections of the site. ***Note: Notice is hereby given the Connecticut Department of Public Health must be notified by applicants for any project located within a public water supply aquifer protection area or watershed area. (CTDPH website at http://www.dph.state.ct.us)***

Town of West Hartford **Record Owner's Name**	Duane Martin **Applicant's Name**
50 South Main Street **Street**	50 South Main Street **Street**
West Hartford, CT 06107 **City State Zip**	West Hartfor CT 06107 **City State Zip**
_____ **Telephone #**	860-561-7539 **Telephone #**

Contact Person:

Duane Martin **Name**	Duane J. Martin **Applicant's Signature**
50 South Main Street **Street**	 **Signature of Owner/Authorized Agent**
West Hartford CT 06107 **City State Zip**	
860-561-7539 **Telephone #**	Duane M@westhartfordct.gov **E-Mail**

U:\sd\TPZ\Templates\IWWAPermitApplication_April13

RECEIVED
MAY 18

TOWN OF WEST HARTFORD

MEMORANDUM

TO: Todd Dumais, Town Planner

FROM: DJM Duane J. Martin, P.E., Town Engineer

RE: Inland Wetlands and Watercourses Activity Application
Proposed Braeburn Road Drainage Culvert Rehabilitation

DATE: May 18, 2016

The Engineering Division requests an Inland Wetlands and Watercourses Activity Permit for the proposed the rehabilitation of the drainage culvert under Braeburn Road/Whitman Avenue that conveys Trout Brook. The culvert is located under the roadway within the Town's Right of Way at the location where the street name changes between Braeburn Road and Whitman Avenue. The two properties adjacent to the culvert are Town properties, 200 Whitman Avenue (Fairview Cemetery property) and 47 Pleasant Street (Open Space).

The drainage culvert consists of two steel corrugated metal pipes approximately 9 ½ feet wide by 6 feet high. The culvert was installed in 1960. The Connecticut Department of Transportation inspects this drainage structure and several other culverts and bridges in West Hartford every other year. Based upon the last state inspection in 2014, this culvert received a Poor condition rating and was deemed structurally deficient. This determination was primarily due to scouring (washout) at the inlets, outlets, and beneath both pipes. Both pipes also lack the asphalt coating at or below the water level, which allows rust to further deteriorate the pipes. In addition, the pipe bottoms now have small holes. The rehabilitation is required to maintain the structural integrity of the drainage culvert, which allows Braeburn Road/Whitman Avenue to stay open for public travel.

The Town applied for and received grant funding through the Connecticut Department of Transportation's Local Bridge Program to fund part of the proposed culvert rehabilitation project. The Engineering Division retained Tectonic Engineering & Surveying Consultants, P.C. to perform the wetland review, culvert inspection, and culvert rehabilitation design.

The following information is included as part of the Inland Wetlands and Watercourses Activity Application:

1. Completed Town of West Hartford Permit Application for Inland Wetlands & Watercourses Activity

TOWN OF WEST HARTFORD

2. Completed Connecticut Department of Energy and Environmental Protection, Statewide Inland Wetlands & Watercourses Activity Reporting Form
3. 14 Copies of a wetland review letter provided by Environmental Planning Services, LLC

4. 14 Copies of the Inland Wetlands & Watercourses Commission Schematic Report prepared by Tectonic Engineering & Surveying Consultants, P.C.

5. 14 Copies the Schematic Design Report prepared by Tectonic Engineering & Surveying Consultants, P.C.

6. 2 Full size and 14 reduced size copies of the proposed Rehabilitation of the Braeburn Road culvert over Trout Brook

Please note the plans are at a semi-final design stage and we hope to start this project in the summer of 2017. This culvert is located approximately 200 feet east of the Braeburn Elementary School. This project will have some impact to traffic flow, which is why we are hopeful to perform the majority of the impactful work in the summer when school is out and water flow is reduced.

The following information is important to note as it pertains to the proposed work within the regulated area:

Plan Set

- Sheet number 2 in the plan set identifies the flagged wetland limits around the culvert.
- Sheet number 7 identifies the anticipated work limits within the regulated area and the proposed erosion and sedimentation control measures.
- Sheet number 8 details the proposed erosion and sedimentation control measures

Wetland Review Letter

- Explains the review methods and soil types encountered from a site review

Inland Wetlands & Watercourses Commission Schematic Report

- Scope of proposed work
- Description of equipment to be used within the regulated area with corresponding color photos
- Anticipated project duration

- Identified alternative rehabilitation methods considered
- Hydraulic Analyses description of the project's minimal impact on the existing flood zone

Schematic Design Report

- Provides information on the culvert condition and repair methods
- Appendix A includes the Connecticut Department of Transportation's 2014 inspection report with photographs
- Appendix B includes the Tectonic Engineering & Surveying Consultant's Inspection photographs
- Appendix C includes a preliminary culvert analysis report, which compares the current Trout Brook flow to the anticipated flow with the proposed culvert rehabilitation

March 24, 2016

Mr. Jeff Scala
Tectonic Engineering
1344 Silas Deane Highway, Suite 500
Rocky Hill, CT 06067

RE: Braeburn Road @ Trout Brook
West Hartford, CT

Dear Mr. Scala:

EPS was retained to delineate the wetlands and watercourses on a portion of the referenced site as shown on the attached plan. The wetland delineation was conducted by a soil scientist, according to the requirements of the CT Inland Wetlands and Watercourses Act (P.A. 155). Wetlands are defined as areas of poorly drained, very poorly drained, floodplain, and alluvial soils, as delineated by a soil scientist. Watercourses are defined as bogs, swamps, or marshes, as well as lakes, ponds, rivers, streams, etc., whether natural or man-made, permanent or intermittent.

The wetlands were delineated by an EPS soil scientist, who walked over the site on December 10, 2015, and examined the upper portion of the soil profile with a spade and auger. Field conditions were sunny, and seasonal with no snow or frost. Those areas meeting the criteria noted above were marked with sequentially numbered plastic flagging tape. The wetland soils are Walpole loam. The Walpole series consists of very deep, poorly drained sandy soils formed in water-sorted glacial outwash and stratified drift. They are nearly level to gently sloping soils in low-lying positions on terraces and plains. Walpole soils have a water table within 1' of the soil surface much of the year.

The non-wetland soils were not examined in detail, except as was necessary to identify the boundary with the wetland soils. They are mapped as Enfield silt loam. The Enfield series consists of very deep, well drained loamy soils formed in silty mantled glacial outwash. They are nearly level to sloping soils on outwash plains and terraces. Slopes range from 0 to 15 percent, but are generally less than 8 percent. The soils formed in a silty mantle over stratified sandy and gravelly fluvial materials derived from a variety of acid rocks.

89 Belknap Road
West Hartford, CT 06117
Phone 860-236-1578 Fax
michael.klein@epsct.com

10 Maple Street
Chester, CT 06412
Phone 860-322-4524 Fax
eric.davison@epsct.com

138 Mystic Road
North Stonington, CT 06359
Phone 860-535-0625 Fax
james.cowen@epsct.com

www.epsct.com

Please feel free to call me if you have any questions regarding our findings.

Yours truly,

Michael S. Klein, Principal
Soil Scientist
Professional Wetland Scientist

INLAND WETLANDS & WATERCOURSES COMMISSION SCHEMATIC REPORT

CULVERT REPAIRS OF BRIDGE NO. 06076

BRAEBURN ROAD OVER WEST BRANCH TROUT BROOK

WEST HARTFORD, CONNECTICUT

Prepared For:

TOWN OF WEST HARTFORD
COMMUNITY SERVICE DEPARTMENT
ENGINEERING DIVISION
17 BRIXTON STREET
WEST HARTFORD, CONNECTICUT 06110

Prepared By:

TECTONIC ENGINEERING & SURVEYING CONSULTANTS, P.C.
1344 SILAS DEANE HIGHWAY
ROCKY HILL, CONNECTICUT 06067

PUBLICATION DATE: APRIL 14, 2016

Scope of Work

The rust, perforations, and section loss presented in the steel corrugated pipes require repair work to preserve the structural integrity of the bridge. The majority of the damage is below the spring line. Two construction stages will be required to complete the repairs. One barrel will remain open at all times throughout the construction process, with the other barrel closed off with steel sheeting at the ends and dewatered. Repair work will then be completed on the partitioned barrel according to the details on drawing 5 of the Design Drawings, which include the welding of stud shear connectors to the existing culverts, the placement of rebar and concrete in the culverts below the spring line, and any steel repair required above the spring line. All missing nuts should be replaced as needed throughout the culverts.

The scour and erosion noticed during the inspections will also require repair work. As noted on drawings 3 and 4 of the Design Drawings, steel sheeting will be installed at the face of the inlets and outlets of both barrels. Riprap will then be installed in front of each opening of both barrels. The debris and overgrowth around the culvert should be cleared prior to construction. Some trees may need to be removed to allow equipment access on both sides of the bridge. See drawing 7 for a plan view of equipment location.

Description of Equipment and Estimated Project Duration

The following is the minimum equipment that will be used during this project:

a) steel sheet pile driving hammer/vibrator
b) excavator (riprap and channel work)
c) Bobcat loader (sandbags)
d) concrete pump
e) water pump (dewatering)
f) dewatering equipment

The estimated project duration is 30-45 days.

Alternative Rehabilitation Methods Considered

During the schematic design, the following three alternatives were investigated (details on page 10 & 11):

1) Adding reinforced concrete to the culvert invert.
2) Repairing deteriorating sections with new corrugated steel bottom sections.
3) Using a culvert liner.

Option 1 was chosen since it is more reliable, easy to construct and maintain, and will provide long term cost savings for the Town.

Photo No. 1

Description: Bobcat Loader

References: TECTONIC 4189.01

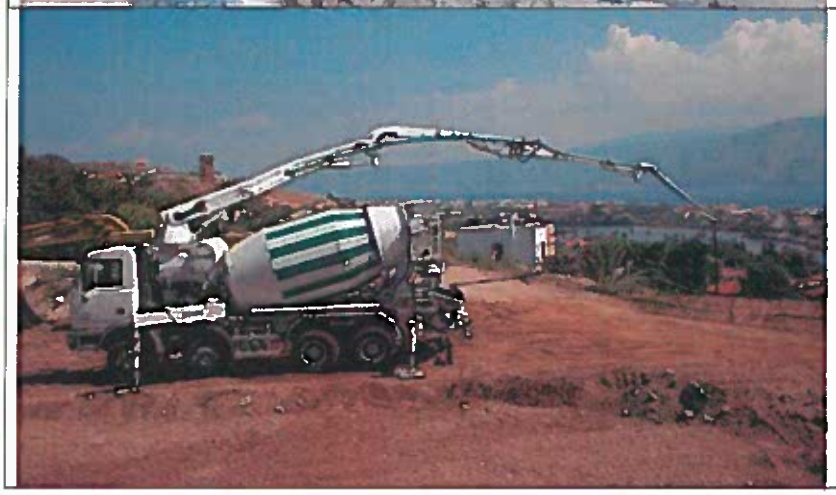


Photo No. 2

Description: Concrete pump

References: Google – example photo

Photo No. 3

Description: Dewatering

References: TECTONIC 4189.01

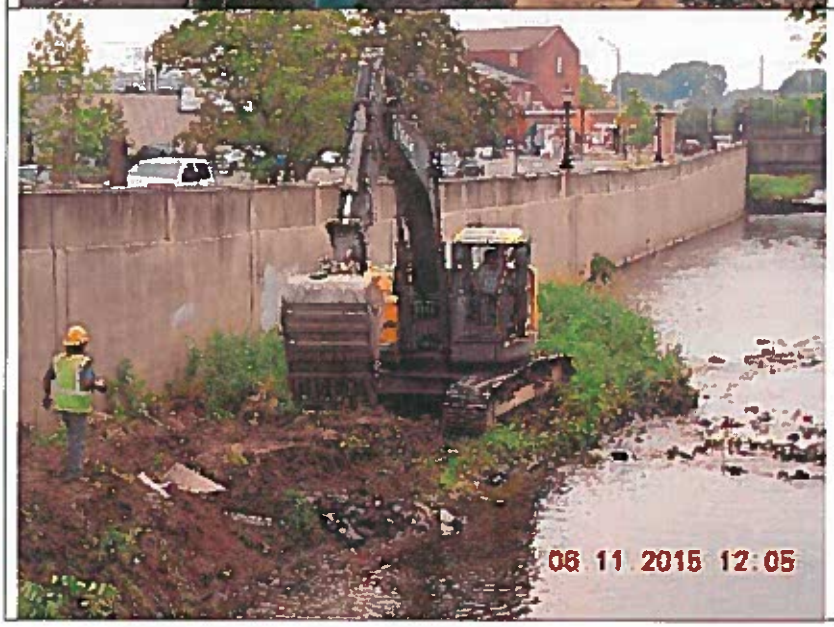


Photo No. 4

Description: Excavator

References: TECTONIC 4189.01

Photo No. 5

Description: Excavator

References: TECTONIC 4189.01

Photo No. 6

Description: Mini Excavator Pipework

References: TECTONIC 4189.01

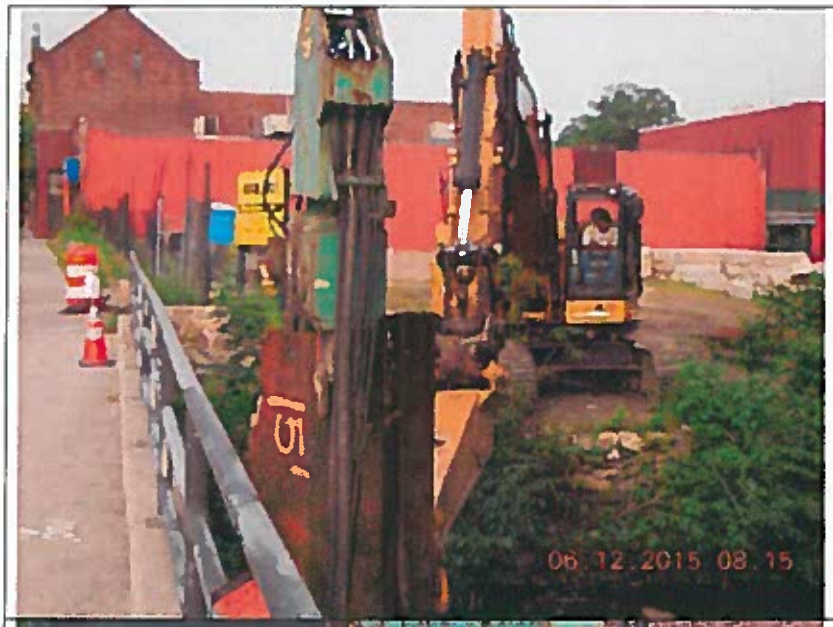


Photo No. 7

Description: Sheet piling

References: TECTONIC 4189.01

Photo No. 8

Description: Sheet piling

References: TECTONIC 4189.01

Photo No. 9

Description: Sheet piling

References: TECTONIC 4189.01

Photo No. 10

Description: Sheet piling

References: TECTONIC 4189.01

Photo No. 11

Description: Sheet piling

References: TECTONIC 4189.01

Photo No. 12

Description: Sheet piling

References: TECTONIC 4189.01

Photo No. 13

Description: Sheet piling

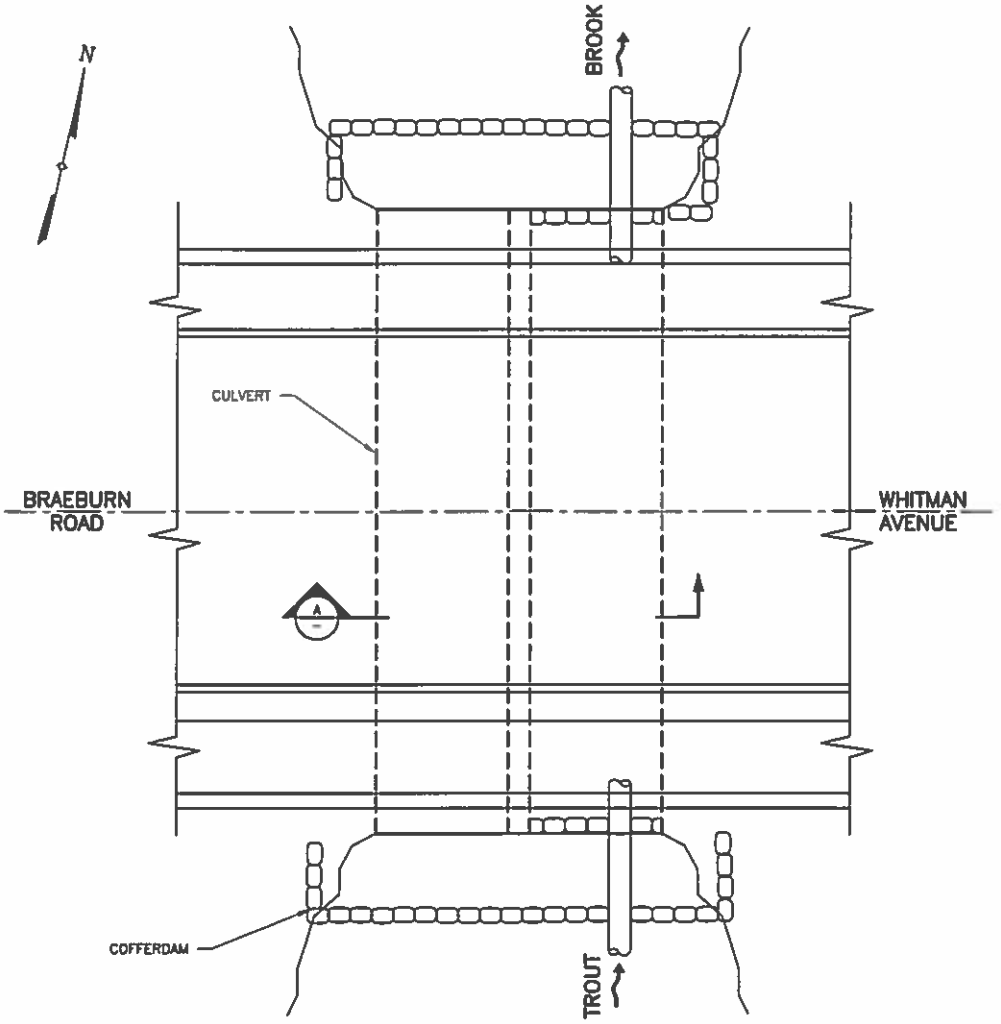
References: TECTONIC 4189.01

Photo No. 14

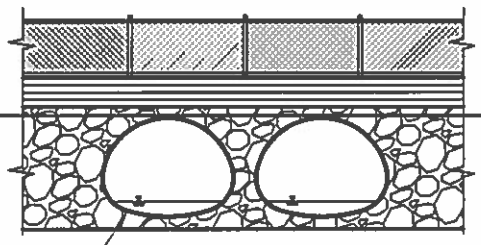
Description: Water Pump

References: TECTONIC 4189.01

	Photo No. 15 Description: Wire wheel brush References: Google – example photo
	Photo No. 16 Description: Wire wheel brush References: Google – example photo



PLAN



DAMAGED CULVERT SECTION.
SEE ENLARGED REPAIR SECTIONS.

SOUTH ELEVATION

PROJECT
BRAEBURN ROAD BRIDGE
OVER TROUT BROOK

DRAWING TITLE
CULVERT REPAIR PLAN

REVISION	BY	CK'D	DATE

TOWN OF
WEST HARTFORD
50 SOUTH MAIN ST.
WEST HARTFORD, CT
06107

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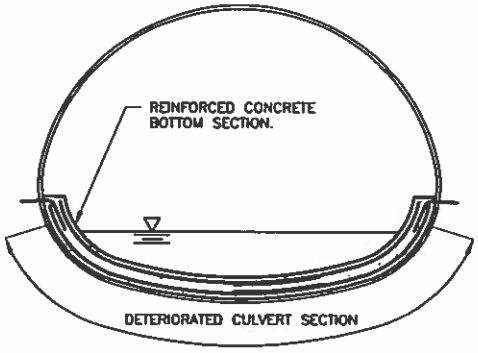
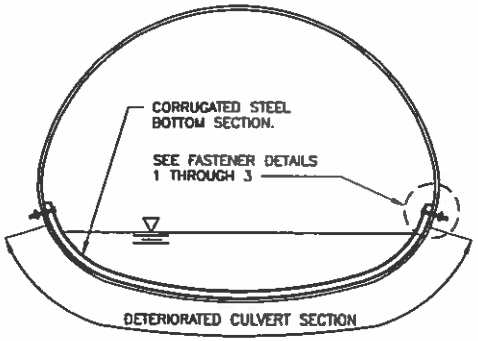
DRAWN BY KRF | CHECKED BY PIO | DATE 10-20-15

PROJECT NO.
PN15-1253

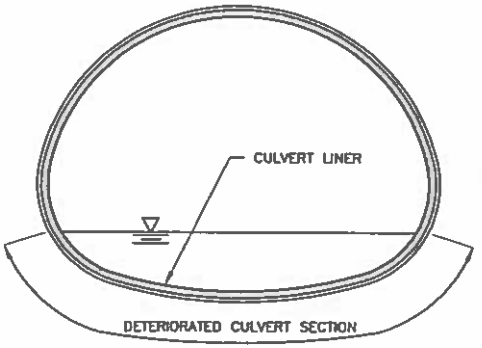
SHEET NO.
S-1



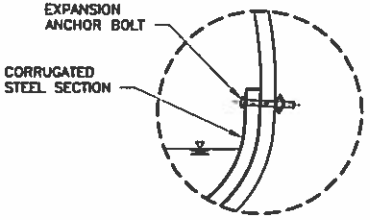
SECTION A – OPTION 1
REINFORCED CONCRETE
BOTTOM SECTION



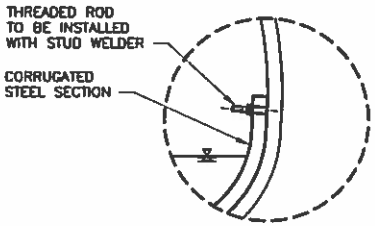
SECTION A – OPTION 2
CORRUGARED STEEL SECTION
WITH FASTENERS



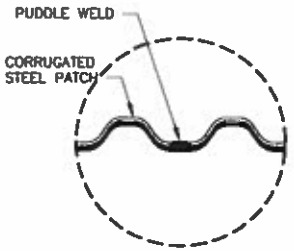
SECTION A – OPTION 3
CULVERT LINER



DETAIL 1 – OPTION 2
EXPANSION ANCHOR BOLT



DETAIL 2 – OPTION 2
WELDED THREADED ROD



DETAIL 3 – OPTION 2
PUDDLE WELD

REVISION	BY	CK'D	DATE

PROJECT
BRAEBURN ROAD BRIDGE
OVER TROUT BROOK

DRAWING TITLE
CULVERT REPAIR
OPTIONS AND DETAILS

TOWN OF WEST HARTFORD
50 SOUTH MAIN STREET
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DRAWN BY KRF | CHECKED BY PIO | DATE 10-20-15

PROJECT NO
PN15-1253

SHEET NO
S-2

Hydraulic Analysis

A complete hydraulic analysis was performed on the culvert and stream. The results are included in the revised Preliminary Culvert Analysis Report found in Appendix C of the revised Schematic Design Report.

The proposed repairs to the culvert is the most common method based on the identified deterioration of the invert, specifically the section loss due to abrasion and corrosion. The modification provides the structural strength and long term protection. This has a minor effect of raising the water surface profiles upstream for a very short distance in the range of 25 to 50 feet (refer to the table on page 13, as shown on page C2 of the revised Schematic Design Report). The smoother concrete offsets some of the increase but not all, with the effect less at higher flow rates.

An alternative to the proposed repair included fabricating new custom plates for the bottom and up part of the sides. This would have negligible effect on the water surface profile. Proprietary systems to line the culvert was another alternative. Based on the size of the culvert, the lining would also be custom made or spray applied. We are not confident that the lining would last as long as the manufactures advertise, nor supply the strength requirements and be thin enough to have minimal effect on the water surface profile.

HY-8 Analysis Results

Crossing Summary Table

Culvert Crossing: Braeburn Road Proposed

Headwater Elevation (ft)		Total Discharge (cfs)		East Discharge (cfs)		West Discharge (cfs)		Roadway Discharge (cfs)	
PORO.	EXIST.	PORO.	EXIST.	PORO.	EXIST.	PORO.	EXIST.	PORO.	EXIST.
130.60	130.34	17.20	17.20	11.20	11.08	6.14	6.12	0.00	0.00
132.58	132.33	163.48	163.48	87.36	87.65	76.12	75.83	0.00	0.00
133.91	133.66	309.76	309.76	161.64	161.85	148.09	147.87	0.00	0.00
135.12	134.83	456.04	456.04	235.49	235.65	220.55	220.39	0.00	0.00
136.33	135.95	602.32	602.32	306.82	309.22	295.50	293.22	0.00	0.00
137.63	137.07	748.60	748.60	379.83	382.47	368.69	366.13	0.00	0.00
138.00	138.00	790.20	862.37	400.64	439.34	389.55	423.03	0.00	0.00
138.38	138.14	894.88	894.88	416.74	447.59	408.53	431.28	69.52	15.64
138.72	138.53	1041.16	1041.16	431.16	484.39	422.96	469.57	186.51	233.40
139.02	138.84	1187.44	1187.44	443.33	490.27	433.17	476.48	310.61	293.19
139.15	138.98	1260.00	1260.00	448.70	469.59	439.51	453.35	371.65	117.81
139.51	139.39	1480.00	1480.00	463.76	498.79	454.67	483.34	561.48	497.65

PROPOSED	CFS	slope of line	df	dy	Elevation
Q2	344	0.00827	112.04	0.93	134.19
Q25	1040	0.00232	1.16	0.00	138.72
Q50	1260	0.00179	0.00	0.00	139.15
Q100	1480	0.00164	0.00	0.00	139.51

EXISTING	CFS	slope of line	df	dy	Elevation
Q2	344	0.008	112.04	0.90	133.93
Q25	1040	0.00267	1.16	0.00	138.53
Q50	1260	0.00193	0.00	0.00	138.98
Q100	1480	0.00186	0.00	0.00	139.39